

May 14, 2000

Addressees: Regional Office PM2.5 Monitoring Contacts, Regions 1-10

On 3/4/99 (see below), I sent a note to each Regional Office PM2.5 Contact to inform you of a potential passive sampling issue associated with the Andersen RAAS PM2.5 Sequential Filter Sampler System. We also posted this information on the AMTIC PM2.5 web site. I intend to use this note to reach some closure on this issue.

Since 3/99, several things have happened that have improved the data collection from the Andersen samplers, as well as the entire PM2.5 network. With regard to the specific issue described in our 3/4/99 memo about passive dust intrusion into the Andersen samplers, Andersen has developed and distributed a new air intake filter kit as illustrated in their technical bulletin 21 (I'll include as an attachment). This new intake kit has been approved by the U.S. EPA as an option for both the Andersen sequential and single channel sampler designated as federal reference methods. EPA recommends that all agencies use this new intake kit for their Andersen sequential samplers. State and local agencies who are interested in using the new air intake kit should have requested, received, and installed these new intake kits by this time. Any new single channel and sequential samplers shipped out from Andersen in the future will use the new air intake kit.

Filter handling and filter cassette cleaning procedures have improved very much as indicated by limited feedback from States regarding their field and trip blank data. We still encourage any agency, regardless of which type of sampler they may operate, to use field, trip, and lab blanks as tools for identifying any filter contamination issues. We are always going to have to be diligent in how we handle filters for the PM2.5 program. If you are aware of any of your State or local agencies that are experiencing elevated field, trip, or lab blanks, please work with them and with our monitoring and quality assurance staff here as necessary to identify solutions to the problem.

Lee Ann B. Byrd

U.S. EPA

Monitoring & Quality Assurance Group (MD-14)

Research Triangle Park, NC 27711

Date: 9/22/1999

Title: Installation Instructions for the RAAS2.5-AIF Kit

Products: RAAS2.5-100, RAAS2.5-300

Kit includes:

- 1 Back Panel with Air Intake Filter Holder (Filter installed)
- 1 Exhaust Filter
- 1 Door Gasket Material (approximately 7ft)

Tools Required:

- a short Phillips head screw driver (#2)
- a pair of scissors

Instructions:

- Step 1. The unit should not be sampling. The total time for this replacement procedure should be less than 20 minutes.
- Step 2. The WINS impactor and filter tray should be removed and stored in a safe area. Any filter cassettes in the tray should be covered to prevent contamination.
- Step 3. Remove the PM-10 Inlet and downtube.
- Step 4. Remove the six screws that attach the back panel to the main body. This back panel can be discarded. See Figure 1.
- Step 5. Remove the four screws that attach the top to the main body. These screws are located underneath the top of the enclosure. See figure below for further details.
- Step 6. Remove the top.
- Step 7. Clean the interior surfaces of the system by wiping them with an alcohol wipe or a damp cloth.
- Step 8. Install the Exhaust filter in the top. See figure below.
- Step 9. Reinstall the top and secure using the four screws that were removed in step 5.
- Step 10. Install the new back panel with the filter holder. Secure using the six screws that were removed in step 4.
- Step 11. Install the door gasket around the outer edge of the inside of the door. Use scissors to cut the material to the appropriate length for each side.
- Step 12. Reinstall the downtube and PM-10 Inlet.
- Step 13. Reinstall the WINS impactor and filter tray.
- Step 14. The installation is now complete.

Changing the filter media:

- Step 1. Loosen the captive screw on the top of the filter holder.
- Step 2. Slide the filter holder up and back. The filter is located in the part that is removed.
- Step 3. Remove and replace the filter noting the orientation of the air flow direction on the filter. Airflow should be into the enclosure.
- Step 4. Reinstall the filter holder by sliding it down and forward. Check that all four supports are engaged.
- Step 5. Filter change is completed.

Routine Maintenance:

The intake filter should be routinely replaced. The frequency at which the filter should be replaced will depend on local conditions. Because the filter is part of the air stream that maintains the unit at ambient temperature, it should be examined (and replaced if suspect) any time a FTp or ITp flag is seen. The occurrences of these flags indicate a temperature difference greater than that allowed by the standard. The flag can occur under some conditions even with a clean filter.

The exhaust filter is made of a material that can be washed using soap and water. It will also require periodic cleaning, but will last much longer between cleanings.

The interior of the unit should also be frequently cleaned using a damp cloth or alcohol wipe to remove any dust from the system. The degree and frequency of cleaning will depend on the local conditions.

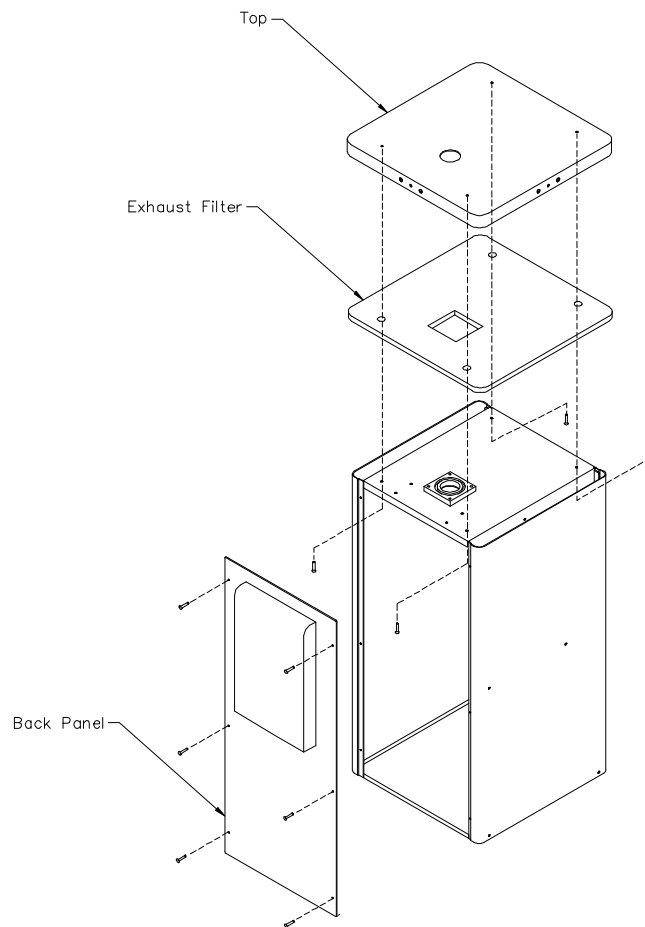
Filter Part Number:

The filter used in the air intake filter is available from Andersen Instruments, Inc and from home supply stores.

Andersen Part Number: 4410-076

Manufacturer Info: Natural Aire Pleated by Precisionire
Size: 12" x 24" x 1" (Actual 11.5" x 23.5" x .75")
UPC#: 31949 14511

The exhaust filter is only available from Andersen Instruments, Inc. The part number is 4410-077. This filter may be washed by the user and does not require routine replacement.



Any questions or comments should be directed to Andersen Instruments Technical Support.

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From: LEE BYRD
To: Regional PM Monitoring Contacts
Date: 3/4/99 11:51am
Subject: Important note on Andersen RAAS PM2.5 Sequential Filter Sampler System

Note

To: Regional Office PM2.5 Contacts
From: Richard D. Scheffe and Lee Ann B. Byrd, MQAG
Subject: Interim Guidance for Operation of Andersen RAAS PM2.5 Sequential Filter Sampler System

The purpose of this note is to inform you of potential passive sampling issues with the Andersen RAAS PM2.5 Sequential Filter Sampler System, and to suggest interim steps to increase the capture of quality data until permanent action can be taken later this spring. This information applies only to the Andersen RAAS PM2.5 Sequential Filter Sampler System, and it does not apply to the Andersen single channel sampler or to any other federal reference method sampler manufactured by other vendors.

We have received reports of isolated cases of intrusion of dust and snow through the sampler's air circulation fan into the body of the Andersen RAAS PM2.5 Sequential Filter Sampler System. This intrusion has the potential for creating passive sampling on filters in the carousel that are not in the actual sampling stream (i.e., those filters that have already sampled or are in line to be used for later sampling, or field blanks). Reports of this potential passive sampling problem have been based upon agencies' reviews of their field blank data which show unusually high mass. We are still working to gather complete information and supporting data to fully characterize the issue; however, given the seriousness of the potential problem and the need for ensuring appropriate data collection in 1999, we must take immediate action to inform State and local agencies of this potential risk.

As a precaution, we are encouraging State and local agencies operating the Andersen RAAS PM2.5 Sequential Filter Sampler System to collect more frequent field blanks and to consider collecting trip blanks. A trip blank constitutes bringing an unexposed filter to a sampling site and returning it to the agency's lab without removing the filter cassette assembly from its protective container. A trip blank filter is not entered into the sampling stream or the filter carousel of the sampler. A trip blank can help to further delineate passive deposition from field handling contamination onto filters. Section 2.12 of the EPA's Quality Assurance Handbook for Air Pollution Measurement Systems specifies that State and local agencies collect field blanks routinely for every 10% of samples; however, we suggest the following interim procedures for agencies operating the Andersen RAAS PM2.5 Sequential Filter Sampler System:

A. There should be a field blank with *each* batch of sequential filters installed in the sampler. This field blank is transferred to the sampler's carousel along with the other filters, remains there with the other filters, and is retrieved with the collected samples. The blanks can revert to the normal frequency if and when they show little chance of exceeding the 30 μg criteria defined in Section 2.12 of the EPA's Quality Assurance Handbook for Air Pollution Measurement Systems.

B. A trip blank should accompany *each* batch of sequential filters installed in the sampler. The trip blank is transported to the sampler with the other filters using the same shipping or transport method for both the trip blank and sample filters. The trip blank, *still within its protective transport container*, should be retained on site but not necessarily within the case of the sampler for approximately the same time as the field blank is in the field. The similar time intervals for both blanks will permit the trip and field blanks to be compared on a consistent time interval. Under no circumstances should the trip blank filter be placed in the carousel. The trip blanks may revert to their normal frequency if and when they clearly indicate no source of non-sampler contamination.

C. Check to make sure the foam filter is properly installed in the fan shroud as indicated in the manual from Andersen Instruments, Inc.

D. Use great care in transferring filter cassettes to and from the carousel to avoid touching any other part of the sampler or inadvertently brushing dust from the sampler onto the cassettes. Ensure that the cover is in place when not installing or retrieving filters.

E. Install Andersen's retrofit fan filter kit as soon it is available. Continue A above until blanks show little chance of exceeding the 30 μg criteria defined in Section 2.12 of the EPA's Quality Assurance Handbook for Air Pollution Measurement Systems.

As a second precaution, if a State or local agency does observe passive sampling error, we recommend that the sampler be operated in a manual mode with a single filter without additional sampling filters in the carousel. In order to operate the sequential sampler in a manual mode, the site operator would set up the sampler the day prior to a sampling day, cycling the filter to the sampling location beneath and enclosed within the WINS impactor, then, on the day after sampling is complete, retrieve the filter from beneath the WINS impactor. This action will eliminate the potential for passive deposition onto filters inside the carousel that have not yet been used to collect samples, or that are awaiting collection after sampling. Recognizing the additional burden accompanying manual sampler operation, EPA will allow a temporary reduced sampling frequency, only for those sites operating the Andersen RAAS PM_{2.5} Sequential Filter Sampler System, down to either one in three or one in six days contingent upon the following condition:

Field blanks at the location of interest have exceeded 30 μg (roughly equivalent to 1 $\mu\text{g}/\text{m}^3$), and trip blanks indicate that contamination is occurring inside the sampler. In general if passive sampling influences are suspected, trip blank values would be expected to be closer to the lab blank levels rather than the field blank levels.

It is expected that sites that would experience impacts from passive sampling would be located in areas with extreme dusty conditions brought about by regional climatology, geographical features (e.g., desert environment) or local influences such as heavy construction or nearby road work.

We offer this interim guidance to maximize the collection of high quality PM_{2.5} samples. Certain agencies may simply choose to operate the subject sampler manually under the current

sampling frequency arrangements of once every third or every day. Obviously, we commend those extra efforts in meeting those sampling schedules. You will need to work closely with the State and local agencies in your Region to determine if this problem exists in your locations, and in taking steps to implement these interim steps. We do not want to interfere with operations that are not experiencing this problem, and we want to minimize complications arising from samples collected over different collection frequencies. Each Region will be responsible for formally approving any alteration to the state or local agencies' approved sampling schedule and for confirming in writing the minimum number of samples that would be necessary for the quarter to be deemed as complete.

Andersen Instruments has been extremely responsive to the Agency regarding this issue, and their representatives have assured us that a solution for this potential passive deposition issue will be implemented shortly. They are currently designing and testing a new cooling fan intake filter and associated components with the intention of providing a field-installed retrofit which they believe will reduce dust intrusion by 95%. This new intake filter is intended to become a permanent fix and a recognized element of the FRM sampler. Andersen Instruments made this alteration available for review and discussion during our February 24, 1999, satellite broadcast, copies of which are or very soon will be available from your satellite course downlink coordinator. A list of these coordinators is being distributed to you electronically, and it is also available on the Internet at www.epa.gov/oar/oaqps/eog/apdln.html. Andersen Instruments is shipping sample units to selected State and local agencies for additional field testing, and once this is proven to be successful, appropriate components will be shipped to all affected State and local agencies.

This guidance will be in place until the proposed solution from Andersen Instruments has been received and installed by State and local agencies, and field and trip blank data indicate that passive sampling influences no longer exist. We would appreciate your quick notification and transmittal of this guidance to those agencies operating the Andersen RAAS PM2.5 Sequential Filter Sampler System, as well as your cooperation and judgement in its application. If you have any questions, please contact Lee Byrd at 919-541-5367, byrd.lee@epa.gov.

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****NO SATELLITE DOWNLINK**

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